

WHAT IS CLAIMED IS:

1. A heating element for heating a portion of a semiconductor fabrication furnace, comprising:
 - a base ring having a one coil recess;
 - a coil situated within the one coil recess; and
 - 5 an insulating block affixed to the base ring; wherein the heating element surrounds substantially less than the entirety of the furnace.
- 10 2. The heating element of claim 1, wherein the heating coil is removably situated within the coil recess.
3. The heating element of claim 1, wherein the insulating block is located directly behind the heating coil.
- 15 4. The heating element of claim 1, wherein the base ring and insulating block are both made from the same insulating material.
5. The heating element of claim 4, wherein the insulating material is a vacuum-formed silica fiber and aluminum composite.
- 20 6. The heating element of claim 1, wherein the insulating block is permanently attached to the base ring.

7. The heating element of claim 6, wherein the heating element is configured for low-temperature operation.

8. The heating element of claim 6, wherein the heating element is
5 configured for medium-temperature operation.

9. The heating element of claim 6, wherein the heating element is configured for high-temperature operation.

10 10. The heating element of claim 6, further comprising an insulating spacer removably placed between the insulating block and a second adjacent insulating block.

11. The heating element of claim 10, wherein the insulating spacer is
15 temporarily placed during operation of the heater element.

12. The heating element of claim 6, further comprising an auxiliary insulating cylinder, comprising:

an exterior cylindrical shell sized to fit about the combination of the
20 base ring and at least one insulating block; and

an interior insulator sized to fit between the block and an adjacent insulating block.

13. The heating element of claim 12, wherein:

the inner surface of the exterior cylindrical shell contacts the outer surface of the insulating block and outer surface of the adjacent insulating block; and
the inner surface of the interior insulator contacts the outer surface of the base ring.

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14. A method for heating and insulating a semiconductor fabrication furnace, comprising:

determining a desired operating temperature;

in response to determining a desired operating temperature, selecting

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a corresponding heater element configuration;

placing a first and second heater element having the proper configuration about the furnace, the first heater element corresponding to a first and second temperature zone; and

providing power to at least one coil in the first and second heater

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elements.

15. The method of claim 14, further comprising:

detecting a temperature fluctuation in the first temperature zone; and

in response to detecting the temperature fluctuation, providing

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additional power to at least one coil in the first heater element.

16. The method of claim 15, further comprising:

detecting that a heater coil in the first heater element is no longer functioning; and

in response to detecting the non-functioning heater coil, replacing the first heater element while leaving the second heater element in place.

17. The method of claim 15, further comprising:

5 increasing power to the at least one coil in order to increase the operating temperature of the furnace; and

in response to increasing power to the at least one coil, adding an insulation spacer to the first and second heater elements.

10 18. The method of claim 15, further comprising:

increasing power to the at least one coil in order to increase the operating temperature of the furnace; and

in response to increasing power to the at least one coil, placing an auxiliary insulating cylinder about the first and second heater elements.

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19. A heater configuration for insulating a semiconductor fabrication furnace, comprising:

a first heater, said first heater comprising:

a first base ring having at least one first coil recess;

20 at least one first heating coil situated within the at least one first coil recess; and

at least one first insulating block attached to the first base ring; and

a second heater disposed adjacent to the first heater, the second heater comprising:

25 a second base ring having at least one second coil recess;

at least one second heating coil situated within the at least one second coil recess;

at least one second insulating block attached to the second base ring; and

5 a power means for providing power to the at least one first heating coil and at least one second heating coil;

wherein the at least one first heating coil and at least one second heating coil cooperate to maintain a temperature inside the furnace.

10 20. The heater configuration of claim 19, wherein the first heater may be removed without removing the second heater.